Abstract:

A printhead chip for an inkjet printhead includes a wafer substrate that incorporates drive circuitry. The wafer substrate defines a plurality of ink inlet channels. Nozzle arrangements are positioned on the wafer substrate. Each nozzle arrangement includes a passive nozzle chamber structure that extends from the wafer substrate and bounds a respective ink inlet channel. A dynamic nozzle chamber structure defines a nozzle chamber with the passive nozzle chamber structure and has a roof that defines the ink ejection port. The dynamic structure is displaceable towards the wafer substrate into an actuated position and away from the wafer substrate into a rest position such that a drop of ink can be ejected from the ink ejection port. An elongate micro-electromechanical actuator is connected between the wafer substrate and the dynamic structure. The actuator includes a beam assembly that has an active beam of a conductive material, capable of thermal expansion, that defines a heating circuit and is connected to the drive circuitry and a passive beam that is interposed between the active beam and the wafer substrate such that, when the active beam receives an electrical signal from the drive circuitry, the active beam expands relative to the passive beam driving the dynamic structure into the actuated position to generate the drop of ink and when the signal is cut off subsequent cooling of the active beam causes the dynamic structure to move back to the rest position, facilitating a separation of the drop of ink.